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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/673,188

09/30/2003

Hironobu Sai

033022-010

1256

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7590

07/26/2005

BUCHANAN INGERSOLL PC  
(INCLUDING BURNS, DOANE, SWECKER & MATHIS)  
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EXAMINER

LE, THAO X

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/673,188	Applicant(s) SAI ET AL.	
	Examiner Thao X. Le	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 5-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 10 and 11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings were received on 29 June 2005. This drawing is acceptable.

### ***Election/Restrictions***

2. This application contains claims 5-9 drawn to an invention nonelected with traverse in the amendment dated 13 Jan 2005. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5621750 to Iwano et al. in view of US 6559070 to Mandal.

Regarding claim 1, Iwano semiconductor light emitting device (LED) in fig. 5A comprising: a mesa section (convex portion) having at least sandwich structure of an n-type clad layer 104, column 14 line 51, an active layer 105, column 14 line 52, and a p-type clad layer 106, column 14 line 56, which are constituted by compound semiconductor layers formed on a substrate 102, column 14 line 45; and an inorganic insulating film formed 108, column 15 lines 5-15, to cover the mesa section excluding a contact region.

But, Iwano does not disclose the LED wherein the inorganic insulating film 108 is constituted by an inorganic insulating film having a vacancy rate of 50% or more.

However, Mandal discloses an inorganic insulating layer (silicon oxide), column 5 line 27, being used in the semiconductor device, column 1 lines 10-20, having a vacancy (porosity) rate of 50% or more, column 5 line 46. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the inorganic layer teaching of Mandal to replace the inorganic layer 106 in Iwano's device, because such insulating material would have low dielectric constant to reduce the capacitance coupling and ion diffusion resistant as taught by Mandal, column 1 line 21-25, column 3 lines 13-15 and column 5 line 47.

The 'vacancy' is being interpreted as a 'porosity' or 'holes' structure.

Regarding claim 2, Iwano does not disclose the semiconductor light emitting device according wherein the inorganic insulating film includes a vacancy having a degree of orientation.

However, Mandal discloses an inorganic insulating layer having a vacancy having a degree of orientation, fig. 13 (the mesoporous oxide is oriented in different directions). . At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the inorganic layer teaching of Mandal to replace the inorganic layer 106 in Iwano's device, because such insulating material would have low dielectric constant to reduce the capacitance coupling and ion diffusion resistant as taught by Mandal, column 1 line 21-25, column 3 lines 13-15 and column 5 line 47.

Regarding claim 3, Iwano does not disclose the semiconductor light emitting device according to claim 2, wherein the inorganic insulating film includes an inorganic insulating film having at least two kinds of periodic porous structures.

However, Mandal discloses an inorganic insulating film includes an inorganic insulating film, column 5 line 27, having at least two kinds of periodic porous structures, fig. 13 (the structures show that the porosity extending in at least two directions and one is being adjacent to another). . At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the inorganic layer teaching of Mandal to replace the inorganic layer 106 in Iwano's device, because such insulating material would have low dielectric

constant to reduce the capacitance coupling and ion diffusion resistant as taught by Mandal, column 1 line 21-25, column 3 lines 13-15 and column 5 line 47.

Regarding claims 4 and 10-11, Iwano discloses the semiconductor light emitting device according to any of claims to 3, wherein the mesa section includes a surface emission structure having an electrode 112, column 15 line 18, in a top portion and comprises a semiconductor layer 109, column 14 line 56, provided with an active layer 105 having a quantum well structure, column 14 line 53, constituted by a compound semiconductor, and a pad 112, fig. 1 (electrode 112 comprises a pad as shown in fig. 1), to come in contact with the electrode 112 is provided on the inorganic insulating film 108.

### ***Response to Arguments***

6. Applicant's arguments filed 29 June 2005 have been fully considered but they are not persuasive. The Applicant argues that Mandal cannot be combined with Iwano because Iwano teaches using an insulating film 107 in order to prevent degradation caused by voids whereas Mandal teaches a film having voids. This is not persuasive because the insulating layer being discussed in the Office Action dated 03/02/05 is the layer 108 of Iwano NOT layer 107. Iwano discloses the film 108 comprising materials such as SiO or SiN, column 15 lines 7, while Mandal discloses the mesoporous SiO layer, column 5 line 27. Therefore, the Examiner respectfully submits that using the mesoporous SiO layer of Mandal in place of layer 108 of Iwano is proper because it would not destroy Iwano's invention and that is in contrary to the Applicant's argument.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

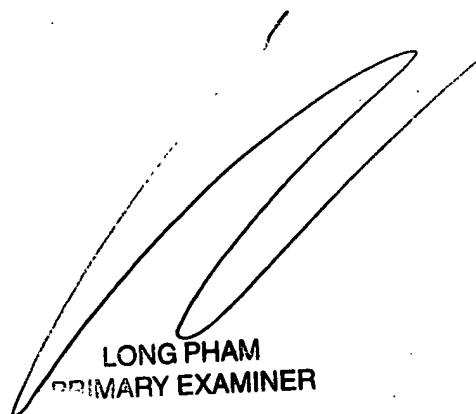
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thao X. Le  
Patent Examiner  
23 July 2005

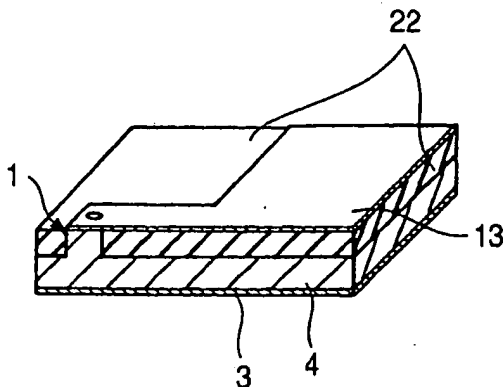


LONG PHAM  
PRIMARY EXAMINER





FIG. 1



OK  
TL

FIG. 2

